PARE PROJECT NO. 02175.00

FINAL REPORT

BIKE ROUTE SIGNING

STATEWIDE, RHODE ISLAND

For

Rhode Island Department of Transportation
RI Contract No. 2002-EI-008

MAY 3, 2006

PARE CORPORATION

TABLE OF CONTENTS

SECTION 1

OVERVIEW

Introduction

The Rhode Island Department of Transportation (RIDOT) has retained Pare Engineering Corporation (PARE) to submit a summary of the bike route signage that exists throughout the State. The location of the existing bike routes and bike lanes as well as constraints and opportunities for connecting this network of bike facilities is investigated. The intent of this review is to present to RIDOT the opportunity to reconsider its policy regarding the selection of roadways as bike routes.

Bicycle route and destination signs are considered traffic control devices by the "*Manual of Uniform Traffic Control Devices for Streets and Highways, 2003 Edition"* (MUTCD). In Part 1, GENERAL, of the MUTCD, the purpose, principle, placement and operation and maintenance of traffic control devices is described.

This section states that sound engineering study and judgment should be exercised in the selection and application of traffic control devices.

According to the MUTCD:

> *To be effective, a traffic control device should meet five basic requirements:*
> *A. Fulfill a need;*
> *B. Command attention;*
> *C. Convey a clear simple meaning;*
> *D. Command respect from road users; and*
> *E. Give adequate time for proper response.*
>
> *Design, placement, operation, maintenance, and uniformity are aspects that should be carefully considered in order to maximize the ability of a traffic control device to meet the five requirement listed in the previous paragraph.*

SECTION 2

CRITERIA

General Guidelines

The 1999 American Association of State Highway and Transportation Officials (AASHTO) "*Guide for the Development of Bicycle Facilities"* defines three bicycle user types that are a helpful guide in assisting highway designers in determining the impact of different facility types and roadway conditions on bicyclists:

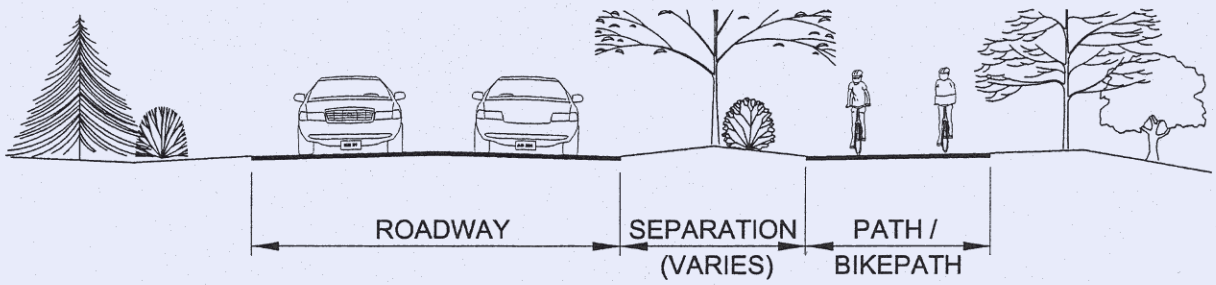
- Group A – Advanced Bicyclists: These are experienced riders who can operate under most traffic conditions. They are typically comfortable riding with motor vehicle traffic; however they need sufficient operating space on the traveled way or shoulder to eliminate the need for either them or a passing vehicle to shift position.
- Group B – Basic Bicyclists: These are casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. Thus, basic riders are comfortable riding on neighborhood streets and Shared Use Paths and prefer designated facilities such as Bike Lanes or wide shoulder lanes on busier streets.
- Group C – Children: These bicyclists ride on their own or with their parents. Residential streets with low motor vehicle speeds, linked with Shared Use Paths and busier streets with well-defined pavement markings between bicycles and vehicles, can accommodate children without encouraging them to ride in the travel lane of major arterials.

Bicycle Facility Design

Bikeway classification is based on AASHTO's description of each of the four bike facility types as explained below. Figure 1, Bike Facility Class, illustrates three of these types. The recommended bicycle facility is based on several factors including the ability of the users, specific corridor conditions, existing roadway conditions, and associated costs necessary to upgrade the roadway to an acceptable bicycle facility.

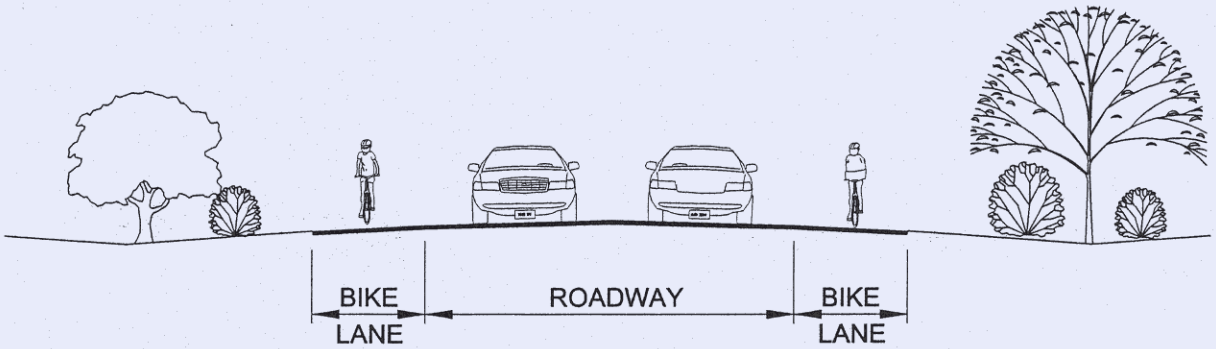
Shared Use Path:

Shared Use Paths should be thought of as a complementary system of off-road transportation routes for bicyclists and others that serve as a necessary extension to the roadway network. Most Shared Use Paths are facilities on exclusive right-of-way, are designed off-road, and are physically separated from motor vehicle traffic. Shared Use Paths can be located along rivers, ocean fronts, canals, abandoned or active railroad and utility right-of-way, limited access freeways, within college



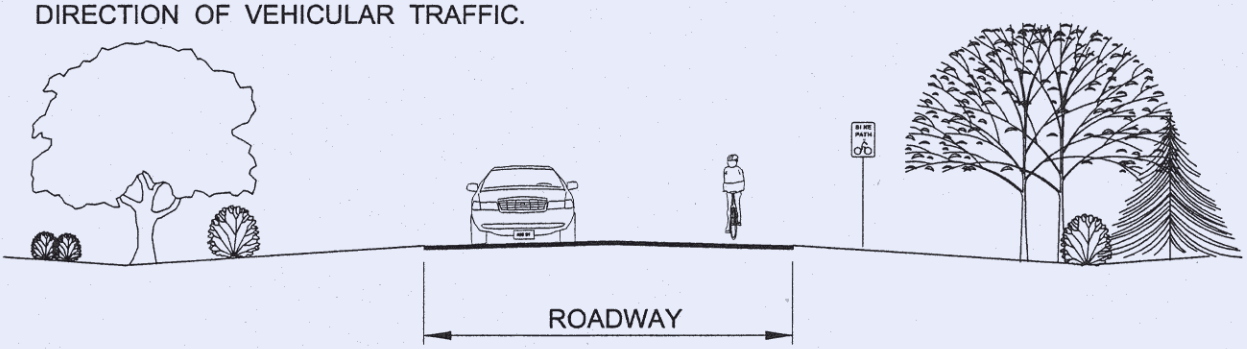
SHARED USE PATH / BIKE PATH - CLASS I

A BIKEWAY PHYSICALLY SEPARATED FROM MOTORIZED VEHICLUAR TRAFFIC BY AN OPEN SPACE OR BARRIER WITHIN THE HIGHWAY RIGHT - OF - WAY OR WITHIN AN INDEPENDENT RIGHT - OF - WAY. THESE PATHS WILL ALSO BE USED BY PEDESTRIANS, SKATERS, WHEELCHAIRS, JOGGERS AND OTHER NON - MOTORIZED USERS.



BIKE LANE - CLASS II

A PORTION OF A ROADWAY WHICH HAS BEEN DESIGNATED BY STRIPING, SIGNING, AND PAVEMENT MARKINGS FOR THE PREFERENTIAL OR EXCLUSIVE USE OF BICYCLISTS. BIKE LANES ARE ONE - WAY DIRECTIONAL TRAVEL LANES, CORRESPONDING WITH THE DIRECTION OF VEHICULAR TRAFFIC.



SIGNED SHARED ROADWAY / SIGNED BIKE ROUTE - CLASS III

A SHARED ROADWAY WHICH HAS BEEN DESIGNATED BY SIGNING AS A PREFERRED ROUTE FOR BICYCLE USE. THE SHARED ROADWAY, WHICH IS OPEN TO BOTH BICYCLE AND MOTOR VEHICLE TRAVEL, MAY BE WITH OR WITHOUT PAVED SHOULDERS AND / OR CURBING. BICYCLISTS TRAVEL IN THE SAME DIRECTION AS VEHICLES SHARING THE SAME SIDE OF THE ROADWAY.

Not To Scale

PARE ENGINEERING CORPORATION
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

N W E S

BIKE FACILITY CLASS

FIGURE 1

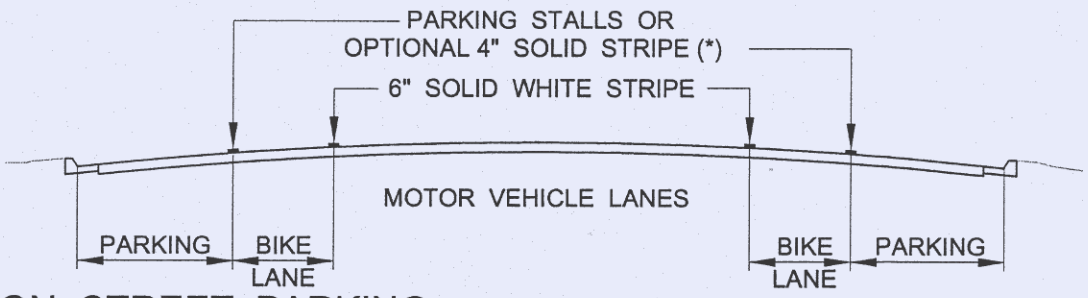
campuses or within and between parks. Shared Use Paths are designed to work with the on-road bicycle facilities to provide the greatest opportunities to bicyclists and pedestrians. For Shared Use Paths to be successful, it is very important to provide users with connections to the roadway network. A critical component of Shared Use Paths are the transitions to and from the roadway network.

Bike Lane:

A Bike Lane is a portion of roadway that has been designated with striping, signing, and pavement markings for preferred or exclusive use by bicyclists. Bike Lanes should always be one-way, carrying bicyclists in the same direction as the adjacent travel lane and on the right side of the road. Minimum motor vehicle travel lane width is the same as for that of the Shared Roadway, 12 feet minimum, 14 feet desirable. Widths greater than 14 feet may encourage the undesirable operation of two motor vehicles in one lane and therefore is not recommended. In areas where 15 feet or more of pavement width exists, striping of lanes for bikes or shoulders should be considered. Width requirements for Bike Lanes vary according to roadway conditions. Bike Lanes may have a minimum width of 4 feet, where the area beyond the paved shoulder can provide additional maneuvering width. A width of 5 feet or greater is preferred where truck traffic is present or where motor vehicle speeds exceed 50 MPH. Where parking is permitted, the Bike Lane should be placed between the parking area and the travel lane and have a minimum width of 5 feet. A Bike Lane should be delineated from motor vehicle travel lanes with a 6-inch solid white line. Figure 2, Typical Bike Lane Cross Sections, is the standard provided by AASHTO for the delineation and designations of Bike Lanes for different situations.

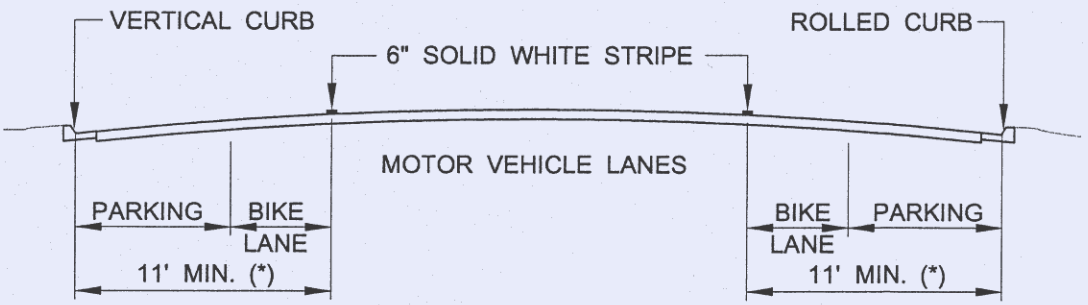
Signed Shared Roadway:

Signed Shared Roadways are those roads that have been identified by signing only as preferred bike routes through high demand corridors. Certain criteria must be considered prior to signing a Signed Shared Roadway. These include, but are not limited to, the removal or restriction of on-street parking, smooth riding surface, regularly maintained roadways that meet the needs of bicyclists, and have wide shoulders.



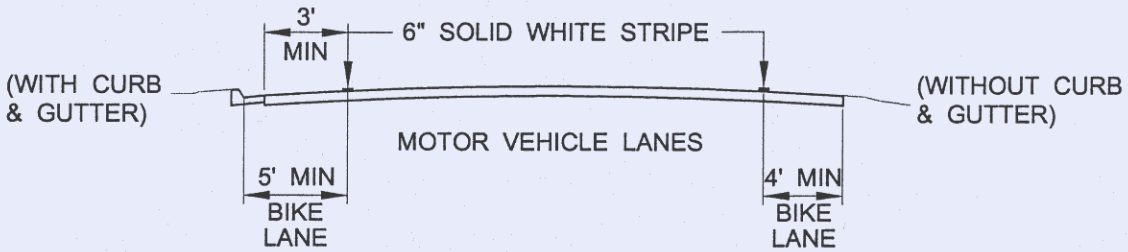
ON STREET PARKING

*THE OPTIONAL SOLID WHITE STRIPE MAY BE ADVISABLE WHERE STALLS ARE NECESSARY (BECAUSE PARKING IS LIGHT) BUT THERE IS CONCERN THAT MOTORISTS MAY MISCONSTRUE THE BIKE LANE TO BE A TRAFFIC LANE.

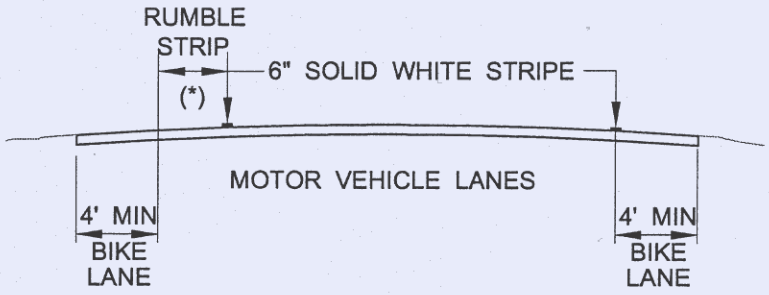


PARKING PERMITTED WITHOUT PARKING STRIPE OR STALL

* 13 ' IS RECOMMENDED WHERE THERE IS SUBSTANTIAL PARKING OR TURNOVER OF PARKED CARS IN HIGH (e.g. COMMERCIAL) AREAS.



PARKING PROHIBITED



TYPICAL ROADWAY IN OUTLYING AREAS PARKING PROTECTED

*IF RUMBLE STRIPS EXIST THERE SHOULD BE 4' MINIMUM FROM THE RUMBLE STRIPS TO THE OUTSIDE EDGE OF THE SHOULDER.

Not To Scale

PARE ENGINEERING CORPORATION
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401 - 334 - 4100

N W E S

TYPICAL BIKE LANE CROSS SECTIONS

FIGURE 2

A Signed Shared Roadway should have particular advantages for bicyclists over alternative routes. According to AASHTO, Signed Shared Roadways should provide through and direct travel, connect to other bicycle facilities, and give priority to bicyclists. Signing also advises motorists that bicycles are present.

According to AASHTO, "width is the most critical variable affecting the ability of a roadway to accommodate bicycle traffic. In order for bicycles and motor vehicles to share the use of a roadway without compromising the level of service and safety for either, the facility should provide sufficient paved width to accommodate both modes." AASHTO recommended paved widths vary with the roadway conditions. Like that of a "Shared Roadway," minimum lane width of 12 feet is required but 14 feet is desirable to accommodate both bicyclists and motorists. These minimum useable lane widths provide maneuvering room for drivers exiting from or in areas with limited sight distances.

Signed Shared Roadways should be signed approximately every ¼ mile and at signalized intersections with both guide and supplemental signs. Also, directional signs are to be placed at every turn to both mark the road and to confirm that the rider has made the correct turn. Bicycle warning signs should be installed to warn bicyclists of conditions not readily apparent, such as "HILL" or "CURVE", along the route. Roadways that do not meet the criteria for a Signed Shared Roadway should not be signed as such. However, destination signs may be posted if the roadway leads to a logical destination such as a park, school, or municipal offices. Crossing signs and crosswalks can be proposed at locations where it is necessary to cross the road to access Signed Shared Roadways, Shared Use Paths, or other destinations.

AASHTO provides the following reasons for designating a road as a Signed Shared Roadway as follows:

Signed Shared Roadways are those that have been identified by signing as preferred bike routes. There are several reasons for designating signed bike routes:

a. *The route provides continuity to other bicycle facilities such as bike lanes and shared use paths.*
b. *The road is a common route for bicyclists through a high demand corridor.*
c. *In rural areas, the route is preferred for bicycling due to low motor vehicle traffic volume or paved shoulder availability.*

d. *The route extends along local neighborhood streets and collectors that lead to an internal neighborhood destination such as a park, church, school or commercial district.*

Signing also advises motorists that bicycles are present. Once a route has been signed it means that the responsible agencies have taken action to ensure these routes are suitable as shared routes for both the bicyclist and motorist and that they will be maintained regularly. Maintenance of the route will be at a higher standard than that of other comparable streets (e.g. more frequent street sweeping, tree trimming and removal of edge of road obstructions). The agency or municipality is ultimately responsible for prioritizing a recurring maintenance schedule for this roadway that has been designated as a Signed Shared Roadway, or Bike Route.

RIDOT recently established and instituted Design Policy Memo (DPM) Number 920.06 A-1 – titled Bicycle Routes & Share the Road Signs, with Attachment: Bicycle Route Suitability Report, Revision 2, dated 11/08/05. It specifically addresses setting standards for the signing of roadways as bike routes throughout the State. Its description states that *"this DPM serves as general technical guidance for the signing of state and local roadways as bike routes that are constructed utilizing federal and state funds. The intent of this DPM is to sign such roadways as an aid to navigation for experienced and /or commuter cyclists in determining those roadways that may be designated as bike routes, utilizing the parameters of sound engineering judgment by considering a given roadway posted speed limit, Average Annual Daily Traffic (AADT) Volume, minimum useable width in feet and other factors. This DPM is not intended to indicate the relative safety of the roadways that are signed as bike routes."*

Item number 5 in Section 920.06.05.01 of the DPM, titled Bicycle Route Sign Criteria, refers to a "Bicycle Route Suitability Recommendation Report". This report contains 24 items that are investigated and documented in a report. The report is provided to RIDOT for review by various departments for consideration of signing a road as a bike route. This information is to be evaluated prior to providing an opinion on the posting of bike route signs on the subject road.

The MUTCD provides sign and pavement markings standards. In contrast, RIDOT specifies that "*all signs on state roadways must conform to the Manual on Uniform Traffic Control Devices (*MUTCD*) D11-1 (Bike Route) sign, to be typically placed at .5 mile intervals"* in item number 4 of the DPM.

Shared Roadways:

A Shared Roadway facility has no bikeway classification or designation. This facility is not shown on Figure 1 since this is any roadway that does not prohibit bicycle traffic. According to AASHTO, different types of roadway conditions can result in a Shared Roadway designation. One condition is that the existing street system is currently being used for efficient bicycle travel without signing and striping. A second condition is that the existing roadway is not deemed suitable for bicycle travel and, therefore, bicycle travel should not be encouraged by designating the Signed Shared Roadway by means of signing and/or marking as an approved bikeway. Another condition that could lead to a Shared Roadway classification is that the roadway is not considered a high demand bicycle corridor and as such the road should not be designated as another bikeway classification, regardless of roadway conditions. On roadways without designated bikeways, a minimum lane width of 12 feet, 14 feet desirable, can best accommodate both the bicyclist and motorist.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Rhode Island Department of Transportation
ENGINEERING DIVISION
Two Capitol Hill, Rm. 226
Providence, RI 02903-1124
PHONE 401-222-2023
FAX 401-222-3006; TDD 401-222-4971

Date: November 8, 2005 TAC 0054

To: All Consultants

Subject: DPM 920.06 - Bicycle Routes Share the Roads Signs
Attachment: Bicycle Route Suitability Report, Revision 2
Revised: 11/08/05

Attached for your use is the revised Bicycle Route Suitability Report. Effective November 8, 2005, all Designers will use the attached report when reviewing the suitability of a route for use by bicyclists.

As the Department continues its DPM review process, different DPMs will be issued upon their completion. Once a DPM is released, a copy of it will be posted on the Department's website, http://www.ridot.us/PMP. As a reminder, the DPMs may not be issued in sequential order. Therefore, we recommend a working binder be maintained until the entire Design Policy Memo and Procedures Manual is completed.

If you have any questions or require additional information, please contact this office or RIDOT Project Manager. Questions/comments may also be directed to RIDOTDesign@dot.state.ri.us . Electronic copies of all recently released Design Policy Memo's, To All Consultants letters, and attachments may be found on the Department's website http://www.ridot.us/PMP.

Sincerely,

Kazem Farhoumand, P.E.
Deputy Chief Engineer

Attachment

STATE OF RHODE ISLAND

DEPARTMENT OF TRANSPORTATION

BICYCLE ROUTE SUITABILITY REPORT

PROJECT: _____

CONSULTANT: _____ REVIEW DATE: _____

ROUTE NAME & NUMBER: _____ CITY/TOWN: _____

ROADWAY LIMITS: _____

Technical Paper No. 130 Roadway Classification _____

"Guide to Cycling in the Ocean State 2003" Roadway Designation _____

The State Highway noted above is being considered for signage as a "Signed Shared Roadway" in accordance with the criteria set forth in RIDOT DPM No. 920.06. The following information is to be provided to the Deputy Chief Engineer of the Design Section for consideration:

ITEM NO.	DESCRIPTION	COMMENT NO. (SEE ENDNOTES)
1	Posted Speed Limit	
2	85th Percentile Speed (Radar speed study)	
3	Average Annual Daily Traffic (AADT) Volume	
4	Percent Truck Traffic Volume	
5	Number of Travel Lanes	
6	Width of Travel Lanes	
7	Width of Shoulders	
8	Delineation of Centerline & Shoulders	
9	Sidewalk	
10	Curbing	
11	On-Street Parking	

ITEM NO.	DESCRIPTION			COMMENT NO. (SEE ENDNOTES)
12	Frequency of Curb Cuts	Moderate		
		Heavy		
		Commercial		
		Residential		
13	Horizontal Alignment Constraints			
14	Vertical Alignment Constraints			
15	Intersections & Corresponding Stopping Sight Distances			
16	Stop Controls Along Roadway			
17	General Roadway Conditions	Surface		
		Potholes		
		Cracking		
		Catch Basin Types		
		Sand & Debris		
18	Are all grates bicycle-safe? (If no, please indicate which ones)	Yes:____	No:____	
18A	Total Number of Grates: _____			
18B	Location of Grates (list): _____			
19	Off-Road Obstacles	Mailboxes, signs		
		Poles		
		Outcrops		
		Hanging Limbs		

ITEM NO.	DESCRIPTION		COMMENT NO. (SEE ENDNOTES)
20	Facilities List on Roadway	Parks	
		Schools	
		Recreational Fields	
		Historical Districts	
		Commercial Establishments	
21	Expected Bike User Type	A – Advanced	
		B – Basic	
		C – Children	
22	Location of nearest Bike Route/Path as potential link		
23	Additional Observations		
24	Accident History (Provide Crash Data for the previous three years according to type, location, injury, roadway surface and time		

COMMENTS
(Expand/Delete as needed)

Based on the information contained in the above "Bicycle Route Suitability Report", the reviewing engineer:

Recommends ( )

Does not recommend ( )

designation of this roadway as a Rhode Island Bicycle Route

Reviewing Engineer:	Date:
Approved Deputy Chief Engineer:	Date:
Approved Chief Engineer:	Date:

SECTION 3

EXISTING CONDITIONS

As part of this report, the existing statewide bike routes (Signed Shared Roadways) as shown on the RIDOT Bike RI Map (Figure 3) were investigated. A field review and general survey of these bike routes was conducted. A list was created that recorded existing roadway conditions pertinent to bike route signing criteria. In particular, close attention was paid to the approximate spacing, location, and the type of sign that was installed. Subsequently, Table 1 was created that lists the existing statewide Signed Shared Roadway and provides corresponding information in regards to the approximate measured bike route length, spacing of signs, and the existence or non existence of Begin and End signage. Photos accompany the table documenting the existing conditions. The following analysis provides a broad overview and discussion of the existing bike route signing policy implemented by RIDOT.

A number of begin and /or end bike route signs were found at places with no noticeable or apparent reason to begin or end at that specific location. This situation was evident on the Statewide Signed Shared Roadways along Routes 2 and 3 in North Kingstown and Exeter in the southern part of the State and along portions of Route 12 in Cranston and Scituate in the northern section of the State. Missing signs contribute to the bicyclist's confusion while riding either route. This is primarily a result of poor maintenance.

Additionally, observations revealed that the majority of the existing state bike route signs were regularly located approximately ½ mile apart. This was the case in areas of continuous roads where intersections and other physical features did not interrupt the landscape. Where the surroundings permit, the space between the signs has been increased to approximately one mile.

Referring to Figure 3, the logic for installing termini bike signs, such as on the Warwick-East Greenwich Bicycle Network at Potowomut near the Sandy Point Beach and at Apponaug Cove, is obvious and clear. Additionally, the Statewide Signed Shared Roadway along Route 1A from Point Judith, Narragansett to Wickford, North Kingstown is scenic from beach to village. These routes support a methodology that the signing should be based on a logical beginning and last stop points; a park, town centers, schools, and churches with places for parking available for single day usage.

The end of a signed bike route could be at a location to provide connections to other modes of transportation by the use of bicycle. These could include Shared Use Paths or the availability of extended transportation by means of car, train, bus, or boat. This multimodal approach would be a strong case for the extension of a bike route. This could be considered for providing bike access to the numerous ferry services in the State. The location of some start and end points of bike routes do not necessarily follow the AASHTO recommendations.

Another notable observation made regarding bike route signage is the overlap that happens on some of the Local Neighborhood and Statewide Bike Routes. This situation exists on the Warwick – East Greenwich Bicycle Network. The separation of the two different bike routes where they are in close proximity to each other is at times unclear. Keeping track of the two separate sign logos is particularly tricky in residential neighborhoods where the roadway network is intertwined

TABLE 1
EXISTING STATEWIDE SIGNED SHARED ROADWAYS

Bike RI Map Designation	Signed Shared Roadway	Begin/End	Approx. Total Measured Length (mile)	Approx. sign spacing (mile)	Bike Route Begin Sign Exists?	Photo No.	Bike Route End Sign Exists?	Photo No.
1	Scituate Avenue	Rt. 5, Cranston to Scituate Reservoir, Scituate	5.7	Varies-average distance between sign is .5 or 1 mile intervals	YES*	1-BEGIN	NO	N/A
2	Route 2	Rt. 102, N.Kingstown to Rt. 138, S. Kingstown	6.5		NO	N/A	YES	2-END
3	Route 3	Division Rd., W. Greenwich to Bakers Pine Rd., Hopkinton	10.5		YES	3-BEGIN	NO	N/A
4	Route 102	Rt. 14/102, Foster to Breakneck Hill Rd., W. Greenwich	9.5		YES*	4-BEGIN	YES	4-END
5	Route 1A	Town Hall, N. Kingstown to Sprague Park, Narragansett	11.3		YES	5-BEGIN	YES	5-END
6	Route 14	Pippin Orchard Rd., Cranston to Rt. 116, Scituate	1.5		YES	6-BEGIN	YES	6-END
7	Pippin Orchard Road	Rt. 14 to Rt. 12, Cranston	1.5		NO	N/A	NO	N/A
8	Route 117	Rt. 102 to Coventry Greenway, Coventry	7.2		YES	8-BEGIN	YES	8-END
9	Route 91 Alton Bradford Rd.	Rt. 112, Charlestown to Bradford Fishing Area, Westerly	6.2		YES	9-BEGIN	YES **	9-END
10	Route 120 Nate Whipple Hgwy.	Mendon Rd., Cumberland to MA State Line	4.8		YES	10-BEGIN	YES	10-END

* "Bike Route" Sign exists but attached "Begin" sign is missing.
** In opposite direction - at Mendon Road - "Bike Route" sign is missing but "Begin" sign exists.

Photograph No. 1 Begin on the Scituate Avenue Signed Shared Roadway at Route 5, Cranston

No End Bike Route Sign on the Scituate Avenue Signed Shared Roadway at Scituate Avenue, Scituate

No End on the Scituate Avenue Signed Shared Roadway at Scituate Avenue, Scituate

No Begin Bike Route Sign on the Route 2 Signed Shared Roadway at Route 102, North Kingstown

No Begin – Route 2 Signed Shared Roadway at Route 102, North Kingstown

Photograph No. 2: End - Route 2 Signed Shared Roadway at Route 138, South Kingstown

Photograph No. 3 Begin on the Route 3 Signed Shared Roadway at Division Road, West Greenwich

No End Bike Route Sign on the Route 3 Signed Shared Roadway at Bakers Pine Road, Hopkinton

No End on the Route 3 Signed Shared Roadway at Bakers Pine Road, Hopkinton

Photograph No. 4 Begin on the Route 102 Signed Shared Roadway at Route 14/102, Foster

Photograph No. 4 End on the Route 102 Signed Shared Roadway at Breakneck Hill Road, West Greenwich

Photograph No. 5 Begin on the Route 1A Signed Shared Roadway at the Town Hall, North Kingstown

Photograph No. 5 End on the Route 1A Signed Shared Roadway at Sprague Park, Narragansett

Photograph No. 6 Begin on the Route 14 Signed Shared Roadway at Pippin Orchard Road, Cranston

Photograph No. 6 End on the Route 14 Signed Shared Roadway at Route 116, Scituate

No Begin Bike Route Sign on the Pippin Orchard Road Signed Shared Roadway at Route 14, Cranston

No Begin on the Pippin Orchard Road Signed Shared Roadway at Route 14, Cranston

No End Bike Route Sign on the Pippin Orchard Road Signed Shared Roadway at Route 12, Cranston

No End on the Pippin Orchard Road Signed Shared Roadway at Route 12, Cranston

Photograph No. 8 Begin on the Route 117 Signed Shared Roadway at Route 102, Coventry

Photograph No. 8 End on the Route 117 Signed Shared Roadway at Coventry Greenway, Coventry

Photograph No. 9 Begin on the Route 91 Alton Bradford Road at Route 112, Charlestown

Photograph No. 9 End on the Route 91 Alton Bradford Road at the Bradford Fishing Area, Westerly

Photograph No. 10 Begin on the Route 120 Nate Whipple Highway at Mendon Road, Cumberland

Photograph No. 10 End on the Route 120 Nate Whipple Highway at the Massachusetts State Line

Rhode Island Department of Transportation
Bike RI

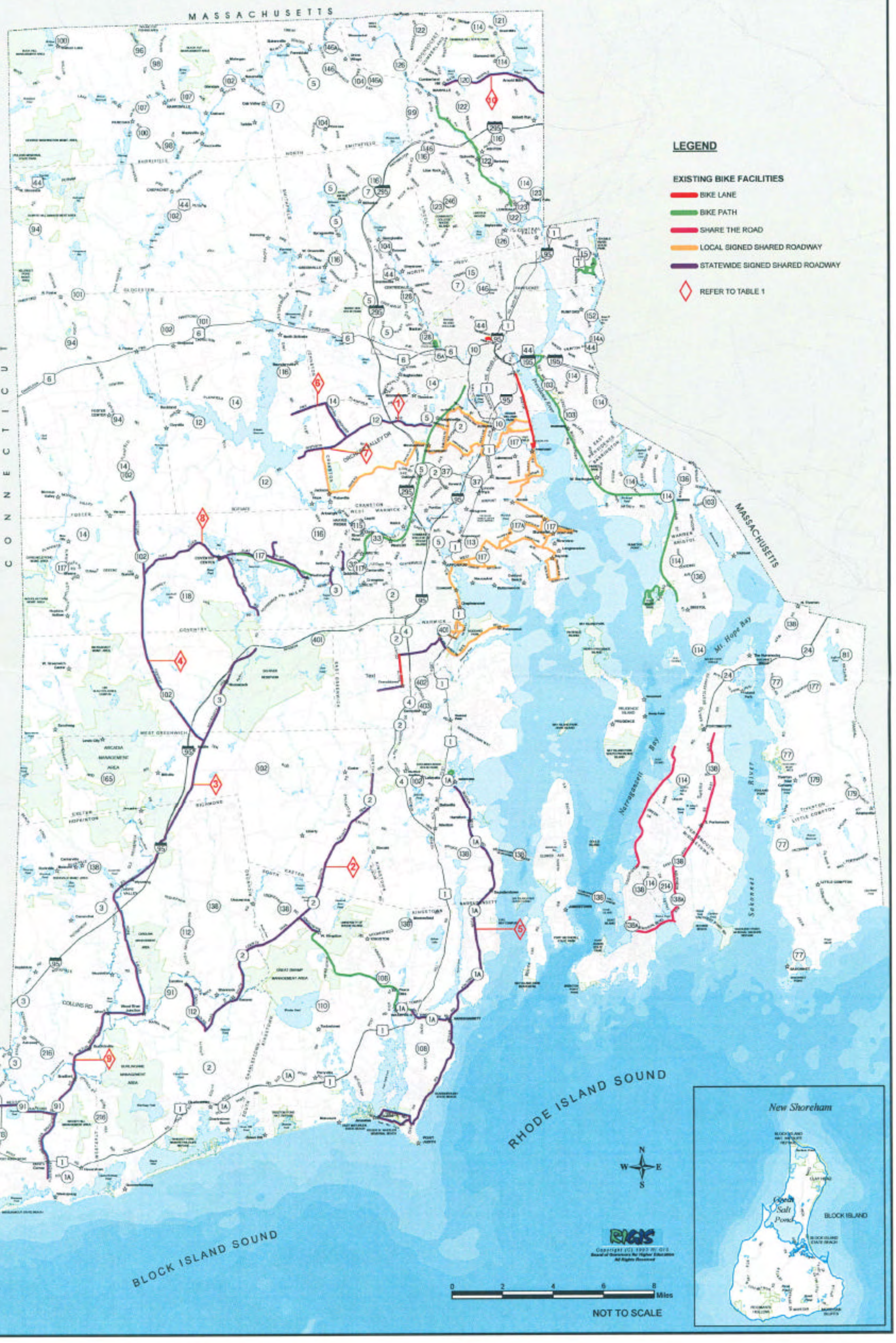


FIGURE 3. BIKE RI MAP

SECTION 4

REFERENCES

Opinions on the subject of the bike route signage issue were solicited from professional individuals and agencies that are associated with the bicycle transportation industry. Their expert opinion on this matter is considered a valuable addition to this study. Their viewpoints about the subject should be considered when making decisions in the future.

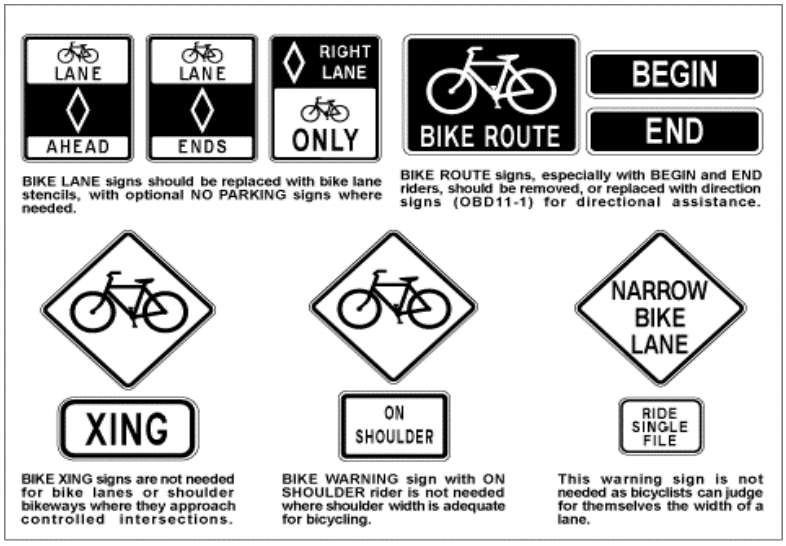
Mr. Michael P. Ronkin, Bike Coordinator for the Oregon Department of Transportation (ODOT) was contacted and offered the following information. In general, ODOT requires no signs for Shared Roadways. Referencing ODOT's website, "*Bicyclists should be expected on all urban local streets, which are mostly shared roadways. Bicyclists riding on shoulder bikeways are well served with adequate width and a smooth pavement. On narrow rural roads heavily used by cyclists, it may be helpful to install bike-warning signs (W11-1) with the rider "ON ROADWAY" or "ON BRIDGE ROADWAY", where there is insufficient shoulder width for a significant distance. This signing should be in advance of the roadway condition. If the roadway condition is continuous, an additional rider "NEXT XX MILES" may be used.*"

Sign W11-1 with riders

ODOT strongly recommends **against** the use of Bike Route signs and arrows like those being used along streets in Rhode Island because there is no indication to cyclists as to where they are being directed. The claim is that cyclists will usually ignore these signs if they send them off direction. Instead ODOT encourages the installation of directional signs as shown below. They claim that they are useful where it is recommended that bicyclists follow a routing that differs from the routing recommended for motorists. This may be for reasons of safety, convenience, or because bicyclists are banned from a section of roadway (the routing must have obvious advantages over other routes).

Sign OBD11-1, Destination

The ODOT recognizes that well-designed roads make it clear to users how to proceed, and require very little signing. Conversely, ODOT considers that an over-abundance of installed warning and regulatory signs may indicate a failure to have addressed problems. The attention of drivers, bicyclists and pedestrians should be on the road and other users, not on signs on the side of the road. Regarding the maintenance of existing signs and pavement markings for bike facilities, ODOT requires periodic review of existing signs, to upgrade and standardize signing. All existing signs and markings are inventoried and recommendations are made to the appropriate office. In most cases, this results in a net decrease in the total number of signs. ODOT is in the process of removing signs that are not appropriate for the situation and bike lane stencils on rural shoulder bikeways. A table of the unwanted signs is given below.



John Forester is a professional engineer and an avid bicyclist. He has combined these interests in founding the discipline of cycling transportation engineering. Mr. Forester is author of several cycling books that addresses many topics associated with bicycle riding. Among those subjects covered are the demographics and economics of cycling, accidents, the effects of bicyclists on traffic, effective educational programs, improving bicycling facilities, and dealing with government cycling policy. Foremost, the author's opinion is that bicyclists do best when they act, and are

treated in return, as drivers of vehicles, with the same rights and responsibilities that motorists have. As such, the intent of signs should be to function effectively for both users, rather than single out one over the other.

Bicycle signs and signing policies in Rhode Island do not appear to currently meet these requirements. States such as Oregon, who are on the leading edge of bicycle advocacy, are heading in a different direction from Rhode Island. Examination of the policies involved with signage should be reviewed to see that these conditions are meet.

Through the development of this report the DPM has been created to implement a more effective method of sign control for bicycle use.

RECOMMENDATIONS

RIDOT's Traffic Engineering section provided comments on the need for better sign control as a relatively inexpensive option for improving a community's appearance and providing a more effective message for vehicle and bicycle users on the road. Well-designed roads usually require very little signing, because they are built so all users understand how to proceed. Conversely, an overabundance of warning and regulatory signs may indicate a failure to have addressed problems. The attention of drivers, bicyclists and pedestrians should be on the road and other users, not on signs along the side of the road. Oversigning of roadways is ineffective and can degrade sign effectiveness. Too many signs are distracting and a visual blight, they may be a waste of resources. The message conveyed by the sign should be easily understandable by all roadway users. The use of symbols is preferred over the use of text.

A recently released Providence Bicycle Network draft report on bike route signing for the City of Providence prepared by Vanasse Hangen Brustlin, Inc. was submitted to RIDOT for review and comment. Figure 4, Proposed Bicycle Routes, Providence, Rhode Island, indicates the proposed route locations. Comments from the Traffic Engineering section of RIDOT in regards to signing indicated that "*the proposed bike routes and lanes be studied to ensure that each selected bike travel path is indeed suitable for signing as a preferred bike route*". Additionally, the comment was made "*that the large number of proposed signed bike routes is excessive…. And, therefore, it is our recommendation that only the most suitable and practical routes be selected for signing*".

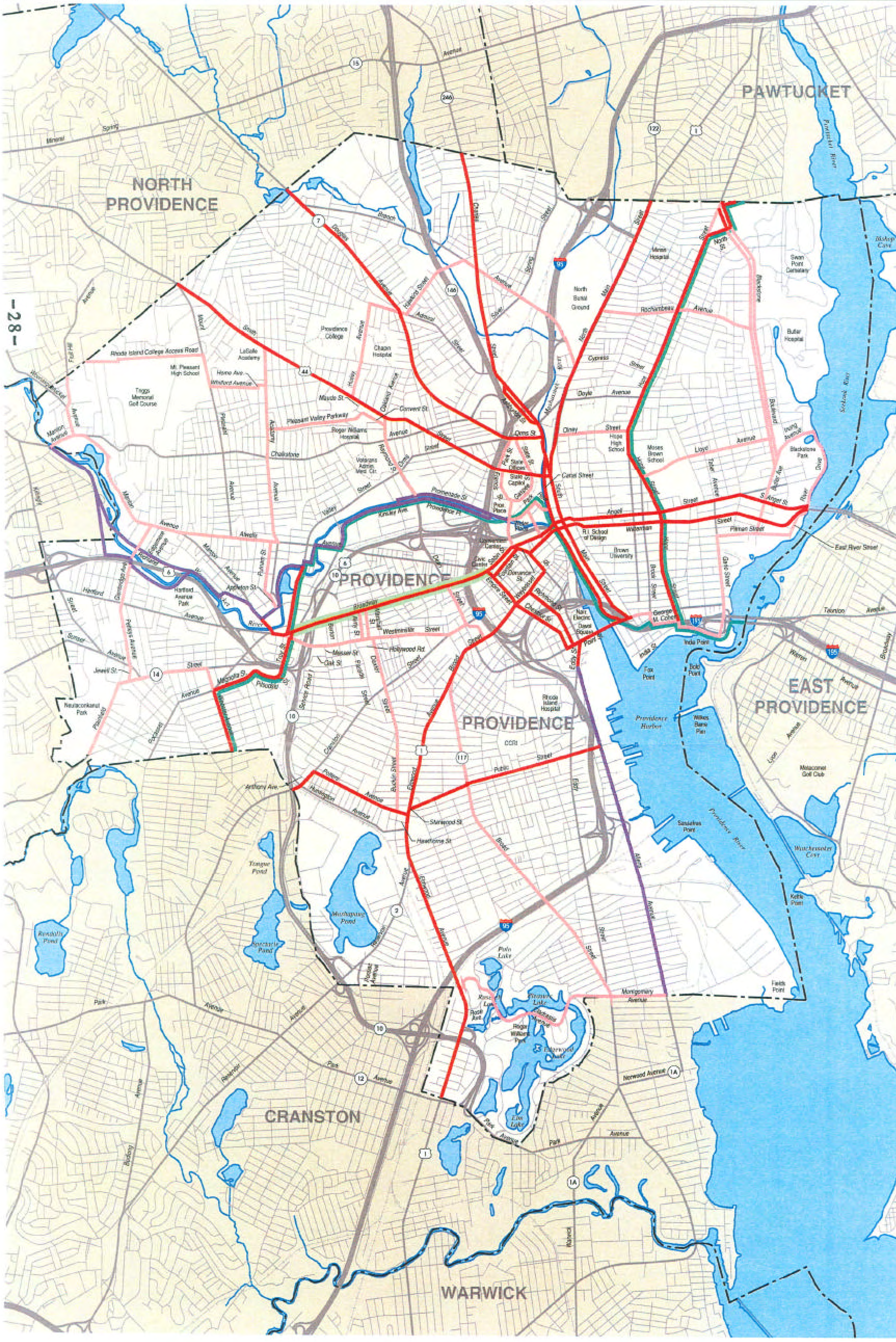
Having evaluated and discussed the current bike route sign methodology in Rhode Island, it is concluded that the Bicycle Route Suitability Report does address the termini points in Item Number 19, Facilities List on Roadway and in Item Number 21, Location of Nearest Bike Route/Path as potential link. This attempts to have the designer evaluate the logic of recommending a Signed Shared Roadway.

Additionally, the Bike RI Map provides a source for the State, Engineer and bike enthusiasts to examine, review and recommend bicycle network connections that are logical.

On the federal level, AASHTO recognizes the need to address the bicycle route signing and other related bicycle issues that exist throughout the country. The organization is attempting to offer consistency in terms of the designation of bike facilities by recommending design standards. The AASHTO Standing Committee on Highways has established an ad hoc Task Force on US Bicycle Routes to encourage the development of a coordinated system of US Bicycle Routes across the country. The task force's first step is to collect, compile, and review information on existing and proposed multi-state bicycle routes designated by states, local jurisdictions and other groups. Once that information is in hand, a proposed corridor plan and numbering system will be developed and reviewed with the key AASHTO technical committees. The endorsed US Bicycle Route Corridor Plan may be used as a tool by the State DOTs in proposing the designation of appropriate roads and highways as part of an interconnected system of US Bicycle Routes. Included in this study will most likely address the bike route signing concerns. This is an opportunity for the State of Rhode Island to contribute, participate, and monitor the committee's proposal in this regard.

Signs need to be an asset to both the motorist and bicyclist. Better sign control is a relatively inexpensive and simple option for improving a community's appearance and providing a more effective message for vehicle and bicycle users on the road. Restricting the installation of bike signs is an opportunity to accomplish these objectives.

Through the development of this report the DPM 920.06 has been created to implement a more effective method of sign control for bicycle usage.



Key:

Providence Bike Plan

- Phase I Bicycle Route
- Striped Bicycle Lane
- Phase II Bicycle Route
- Existing/Under Development
- East Coast Greenway

0 1500 3000 Feet

Vanasse Hangen Brustlin, Inc.

Proposed Bicycle Routes
Providence, Rhode Island

FIGURE 4. PROPOSED

ENGINEERS
SCIENTISTS
PLANNERS

www.parecorp.com